Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Best evidence statement (BESt). Vital sign monitoring in children and adolescents who are overweight or obese in the outpatient physical therapy clinic.

Bibliographic Source(s)

Cincinnati Children's Hospital Medical Center. Best evidence statement (BESt). Vital sign monitoring in children and adolescents who are overweight or obese in the outpatient physical therapy clinic. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2013 Feb 21. 6 p. [15 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The strength of the recommendation (strongly recommended, recommended, or no recommendation) and the quality of the evidence (1aâ€'5b) are defined at the end of the "Major Recommendations" field.

It is recommended that vital signs be assessed prior to and during physical therapy treatment sessions in order to monitor cardiovascular system tolerance to an exercise intervention in children and adolescent patients who are overweight or obese (Carletti et al., 2008 [3a]; Gaya et al., 2009 [4a]; Hayes et al., 2011 [4a]; Norman et al., 2005 [4a]; Ribeiro et al., 2003 [4b]).

Definitions:

Table of Evidence Levels

Quality Level	Definition
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain

5a or 5b Quality Level 5	General review, expert opinion, case report, consensus report, or guideline Definition Local Consensus

†a = good quality study; b = lesser quality study

Table of Recommendation Strength

Strength	Definition
It is strongly recommended that… It is strongly recommended that… not…	When the dimensions for judging the strength of the evidence are applied, there is high support that benefits clearly outweigh risks and burdens. (or visa-versa for negative recommendations)
It is recommended that… It is recommended that… not…	When the dimensions for judging the strength of the evidence are applied, there is moderate support that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation…	

Note: See the original guideline document for the dimensions used for judging the strength of the recommendation.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Childhood and adolescent obesity

Guideline Category

Management

Clinical Specialty

Cardiology

Family Practice

Internal Medicine

Pediatrics

Physical Medicine and Rehabilitation

Intended Users

Advanced Practice Nurses

Nurses

Physical Therapists

Physician Assistants

Physicians

Guideline Objective(s)

To evaluate, among children and adolescents who are overweight or obese, if monitoring patient cardiovascular tolerance during a physical therapy session utilizing vital signs versus standard care reduces the risk of adverse events

Target Population

Children and adolescent patients ages 5 to 18 years with body mass index (BMI) >85th percentile in the outpatient physical therapy setting

Interventions and Practices Considered

Monitoring patient cardiovascular tolerance during a physical therapy session utilizing vital signs

Major Outcomes Considered

- Risk of adverse events from physical therapy treatment sessions
  - Increased resting heart rate
  - Increased arterial blood pressure
  - Oxygen saturation
  - Increased respiration rate
- Patient safety
- Tolerance to physical therapy

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Search Strategy

- Databases: PubMed, Medline, Cochrane Library, CINAHL, SPORTDiscus.
- Search Terms: Obesity, pediatric, exercise, resistance exercise, rate of perceived exertion, children, youth, adolescents, vital sign(s), physical therapy, physiotherapy. The references of the studies meeting the search criteria were then hand-searched.
- Filters: English language, no date filter
- Search Dates: July 26, 2012-November 8, 2012

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Table of Evidence Levels

Quality Level	Definition
1a† or 1b†	Systematic review, meta-analysis, or meta-synthesis of multiple studies
2a or 2b	Best study design for domain
3a or 3b	Fair study design for domain
4a or 4b	Weak study design for domain
5a or 5b	General review, expert opinion, case report, consensus report, or guideline
5	Local Consensus

†a = good quality study; b = lesser quality study

Methods Used to Analyze the Evidence

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Table of Recommendation Strength

Strength	Definition
It is strongly recommended that…	When the dimensions for judging the strength of the evidence are applied, there is high support that benefits clearly outweigh risks and burdens. (or visa-versa for negative recommendations)

Strength	Definition
It is strongly recommended that… not…	
It is recommended that… It is recommended that… not…	When the dimensions for judging the strength of the evidence are applied, there is moderate support that benefits are closely balanced with risks and burdens.
There is insufficient evidence and a lack of consensus to make a recommendation…	

Note: See the original guideline document for the dimensions used for judging the strength of the recommendation.

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

This Best Evidence Statement has been reviewed against quality criteria by 2 independent reviewers from the Cincinnati Children's Hospital Medical Center (CCHMC) Evidence Collaboration.

Evidence Supporting the Recommendations

References Supporting the Recommendations

Carletti L, Rodrigues AN, Perez AJ, Vassallo DV. Blood pressure response to physical exertion in adolescents: influence of overweight and obesity. Arq Bras Cardiol. 2008 Jul;91(1):24-30. PubMed

Gaya AR, Alves A, Aires L, Martins CL, Ribeiro JC, Mota J. Association between time spent in sedentary, moderate to vigorous physical activity, body mass index, cardiorespiratory fitness and blood pressure. Ann Hum Biol. 2009 Jul-Aug;36(4):379-87. PubMed

Hayes HM, Eisenmann JC, Heelen KA, Welk GJ, Tucker JM. Joint association of fatness and physical activity on resting blood pressure in 5- to 9-year-old children. Pediatr Exercise Sci. 2011 Feb;23(1):97-105. PubMed

Norman AC, Drinkard B, McDuffie JR, Ghorbani S, Yanoff LB, Yanovski JA. Influence of excess adiposity on exercise fitness and performance in overweight children and adolescents. Pediatrics. 2005 Jun;115(6):e690-6. PubMed

Ribeiro J, Guerra S, Pinto A, Oliveira J, Duarte J, Mota J. Overweight and obesity in children and adolescents: relationship with blood pressure, and physical activity. Ann Hum Biol. 2003 Mar-Apr;30(2):203-13. PubMed

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Monitoring vital signs during a physical therapy treatment session to ensure children and adolescents are below the lactate threshold, are within target heart rate, and are within safe ranges of systolic and diastolic blood pressure may allow greater tolerance to exercise. With monitoring vital signs, the therapist will be able to track if certain exercises are increasing vital signs too rapidly and in turn, decrease the ability of the patient to perform the exercise. With the therapist monitoring the vital signs and subjective rate of perceived exertion (RPE), the therapist can ensure that the patient's physiological and psychological response is within an appropriate range for the goal of the treatment session.

Potential Harms

There is minimal harm in an appropriately trained physical therapist clinician monitoring vital signs of overweight and obese children and adolescents during a treatment session.

Qualifying Statements

Qualifying Statements

This Best Evidence Statement addresses only key points of care for the target population; it is not intended to be a comprehensive practice guideline. These recommendations result from review of literature and practices current at the time of their formulation. This Best Evidence Statement does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the recommendations to meet the specific and unique requirements of individual patients. Adherence to this Statement is voluntary. The clinician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

Implementation of the Guideline

Description of Implementation Strategy

Applicability Issues

Vital signs can be used to monitor tolerance of exercise and guide outpatient physical therapy treatment for children and adolescents that are overweight or obese. For example, if a patient's blood pressure, heart rate, and respiration rate rise unexpectedly and their rate of perceived exertion (RPE) is higher than the goal for that treatment session, a rest break may be warranted or a change in level of exercise to return vital signs to the patient's baseline level. With monitoring vital signs, the therapist will be able to track if certain exercises are increasing vital signs too rapidly and in turn, decrease the ability of the patient to perform the exercise. With the therapist monitoring the vital signs and subjective RPE, the therapist can ensure that the patient's physiological and psychological response is within an appropriate range for the goal of the treatment session.

Cost: There may be cost associated with obtaining manual blood pressure cuffs, stethoscopes, or electronic (oscillating) blood pressure devices and training staff to use a RPE scale.

Staff Education: Physical therapists and physical therapist assistants are currently trained in vital sign measurement through their Master or Doctor of Physical Therapy programs or their physical therapist assistant program as part of the requirements established by their governing organization, the American Physical Therapy Association. Physical therapists will need to be trained in administering and monitoring a RPE scale.

Equipment: Examples of equipment needed include an oscillometric machine (e.g., Dinamap), electronic forearm blood pressure cuff, or manual blood pressure cuff with stethoscope. Obese children and adolescents may need an adult size blood pressure cuff or a thigh cuff to ensure a good fit and accurate measurement.

Implementation Tools

Audit Criteria/Indicators

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Safety

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013 Feb 21

Guideline Developer(s)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

Source(s) of Funding

Cincinnati Children's Hospital Medical Center

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Group/Team Leader: Amber Boyd, PT, DPT, CSCS, Team Leader, Division of Occupational Therapy and Physical Therapy; Mark V. Paterno, PT, PhD, MBA, SCS, ATC, Division of Occupational Therapy and Physical Therapy

Support/Consultant: Barbara K. Giambra, PhD(c), MS, RN, CPNP, Evidence-Based Practice Mentor, Center for Professional Excellence, Research and Evidence-Based Practice

Financial Disclosures/Conflicts of Interest

Conflict of interest declaration forms are filed with the Cincinnati Children's Hospital Medical Center Evidence-based Decision Making (CCHMC EBDM) group. No financial or intellectual conflicts of interest were found.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Cincinnati Children's Hospital Medical Center Web site .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at EBDMInfo@cchmc.org.

Availability of Companion Documents

The following are available:

- Judging the strength of a recommendation. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .
- Grading a body of evidence to answer a clinical question. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .
- Table of evidence levels. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2009 May 7. 1 p. Available from the Cincinnati Children's Hospital Medical Center Web site .

Print copies: For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Cincinnati Children's Hospital Medical Center Health James M. Anderson Center for Health Systems Excellence at EBDMInfo@cchmc.org.

In addition, suggested process or outcome measures are available in the original guideline document .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on May 22, 2013.

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